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09/603,204	06/26/2000	Kyung-geun Lee	1293.1126/MDS/JGM	2962

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EXAMINER

PATEL, GAUTAM

ART UNIT

PAPER NUMBER

2655

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.
09/603,204

Applicant(s)
Lee et al.

Examiner
Gautam R. Patel

Art Unit
2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE Three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jun 2, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9, 11-17, 29-40, and 49-63 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9, 11-17, 29-40, and 49-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 14, 19 6) ☐ Other:

DETAILED ACTION

1. Claims 9, 11-17, 29-40 and 49-63 are pending for the examination.

RCE STATUS

2. The request filed on 10-9-01 for Request for continued Examination (RCE) under 37 CFR 1.114 based on parent Application is acceptable and a RCE has been established. An action on the RCE follows.

NOTES & REMARKS

3. It seems typographical error was made in REMARKS page 5, para. 3, which says "Claims 9-17, 29-40, and 49-63 are pending and under consideration." however claim 10 has been canceled, so claims 9, 11-17, 29-40 and 49-63 are pending.

Claim Rejections - 35 U.S.C. § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 9 is rejected under 35 U.S.C. § 102(b) as being anticipated by Imaino et al., US. patent 5,449,590 (hereafter Imaino).

As to claim 9, Imaino discloses the invention as claimed [see Figs. 1-29, especially figs. 7, 9-11] including detecting defocus, compensating recording signal and adjusting power level, comprising steps of:

detecting the defocus of the optical recording medium [col. 13, line 47 to col. 14, line 16] using a light beam having a wavelength of roughly 430 nm or less [blue laser] [col. 8, lines 26-38]; and

compensating a recording signal with respect to the detected defocus including adjusting a power level required for recording the recording signal [col. 10, lines 16-26 & col. 13, lines 9-27].

NOTE: Blue laser inherently has wavelength of roughly 430 nm or less.

Claim Rejections - 35 U.S.C. § 103

5. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 11-17, 29-40, 49-63 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Imaino as applied to claim 9 above and in view of Kirino et al., US. patent 5,848,045 (hereafter Kirino).

As to claim 11, Imaino discloses:

detecting the defocus of the optical recording medium [col. 13, lines 47-55];

compensating a write pulse with respect to the detected defocus using a predetermined scheme, wherein the write pulse comprises a predetermined recording pattern [col. 13, lines 9-27; col. 14, lines 3-37];

detecting the tilt of the recording medium of the optical recording medium [col. 13, line 47 to col. 14, line 2 and col. 14, line 47 to col. 15, line 29 and figs. 9-11];

Imaino discloses all of the above elements including detecting defocus and tilt of the recording medium and compensating a write pulse as shown above. Imaino does not specifically disclose well known details of write pulse adjustment and leading pulse last pulse [cooling pulse] etc. and compensating a write time of the write pulse with respect to the detected tilt. However Kirino clearly discloses:

compensating a write time of the write pulse with respect to the detected tilt so as to shift the recording pattern with respect to the detected tilt [col. 13, lines 39-64; col. 19, lines 13-40; col. 21, line 66 to col. 22, line 48 and fig. 10 and 15]. Both Imaino and Kirino are interested in recording and reading information to and from an optical disc in most efficient way and adjusting the laser beam power of the optical system with respect signal provided from focus error and tilt.

One of ordinary skill in the art at the time of invention would have realized that accurate tilt angle detection is necessary for high volume recording [especially with blue laser] and that an equalizer is necessary for high density recording and the tilt information is obtained from the most suitable tap coefficients for accurate tilt angle detection. Therefore, it would have been obvious to have used a an equalizer and pulse compensating scheme, including adjusting first and last pulses in the system of Imaino as taught by Kirino because one would be motivated to detect tilt angle more accurately and distortion of the waveform of reading signal can be removed in a high density recording environment [col. 13, lines 50-64].

7. As to claim 12, Imaino discloses:

the predetermined scheme comprises adjusting a power level with respect to the detected defocus [col. 10, lines 16-26 and col. 13, line 47 to col. 14, line 16].

NOTE: layer change also causes focus error signal FES and laser power gets adjusted accordingly to compensate for focus.

8. As to claim 13, Kirino discloses:
compensating the write pulse with respect to the detected tilt further comprises:
shifting the recording pattern with respect to the detected tilt by both an amount that the recording pattern was shifted due to the detected tilt, and in a direction opposite to the direction that the recording pattern was shifted due to the detected tilt; and
adjusting a power and the write time required for recording with respect to the detected tilt in order to compensate for a size of a recording mark corresponding to the recording signal [col. 13, lines 39-64 and col. 19, lines 13-47].
9. As to claim 14, Kirino discloses:
adjusting a write power to compensate a length of the recording mark; and
the adjusting the time comprises adjusting a write time to compensate a width of the recording mark [col. 13, lines 39-64 and col. 19, lines 13-47].
10. As to claim 15, Kirino discloses:
adjusting the recording mark width comprises adjusting an ending time of a first pulse and/or a starting time of a last pulse of the recording pattern [col. 13, lines 39-64 and col. 19, lines 13-47].
11. As to claim 16, Kirino discloses:
the adjusting the power comprises adjusting a write power to compensate a length of the recording mark, and
adjusting a write power of a multi-pulse chain of the recording pattern to adjust a width of the recording mark [col. 13, lines 39-64 and col. 19, lines 13-47].
12. As to claim 17, Imaino discloses:

detecting the tilt and the defocus of the optical recording medium [col. 13, lin 47 to col. 14, line 46]; and

adaptively compensating the recording pattern with respect to the detected tilt and/or defocus using a memory [fig. 10, unit 314 inherently has memory] [col. 13, line 47 to col. 14, line 46], wherein the memory stores data comprising:

a write power to compensate with respect to the detected defocus [col. 10, lines 16-26];

Imaino discloses all of the above elements including detecting defocus and tilt of the recording medium and compensating a write pulse as shown above. Imaino does not specifically disclose well known details of write pulse adjustment and leading pulse last pulse [cooling pulse] etc. and compensating a write time of the write pulse with respect to the detected tilt. However Kirino clearly discloses:

a power and a time required for recording to compensate for an amount of shift of the recording pattern, and

a power and time required for recording to compensate for a length and width of a recording mark with respect to the detected tilt and/or a length of the recording mark [col. 13, lines 39-64; col. 19, lines 13-40; col. 21, line 66 to col. 22, line 48 and fig. 10 and 15];

Both Imaino and Kirino are interested in recording and reading information to and from an optical disc in most efficient way and adjusting the laser beam power of the optical system with respect signal provided from focus error and tilt.

One of ordinary skill in the art at the time of invention would have realized that accurate tilt angle detection is necessary for high volume recording [especially with blue laser] and that an equalizer is necessary for high density recording and the tilt information is obtained from the most suitable tap coefficients for accurate tilt angle detection. Therefore, it would have been obvious to have used an equalizer and pulse compensating scheme, including adjusting first and last pulses in the system of Imaino as taught by Kirino because one would be motivated to detect tilt angle more accurately

and distortion of the waveform of reading signal can be removed in a high density recording environment [col. 13, lines 50-64].

13. As to claim 29 Imaino discloses

a tilt and/or defocus detector which detects the tilt and/or the defocus of the optical recording medium [col. 13, line 47 to col. 14, line 46]; and

the recording pulse comprises a predetermined recording pattern [col. 13, line 47 to col. 14, line 46];

a recording compensator [fig. 7, unit 212] which compensates a recording pulse with respect to the detected tilt and defocus [col. 13, line 9 to col. 14, line 46] using a predetermined scheme [col. 10, lines 16-26];

Imaino discloses all of the above elements including detecting defocus and tilt of the recording medium and compensating a write pulse as shown above. Imaino does not specifically disclose well known details of write pulse adjustment and leading pulse last pulse [cooling pulse] etc. and adjusting the write time to compensate the width of the mark and adjusting the end of first pulse or start of last pulse. However Kirino clearly discloses:

a scheme to adjust a length and a width of a recording mark according to the detected tilt and/or defocus [col. 13 lines 39-64 and col. 19, lines 13-47].

Both Imaino and Kirino are interested in recording and reading information to and from an optical disc in most efficient way and adjusting the laser beam power of the optical system with respect signal provided from focus error and tilt.

One of ordinary skill in the art at the time of invention would have realized that accurate tilt angle detection is necessary for high volume recording [especially with blue laser] and that an equalizer is necessary for high density recording and the adjustment of pulses length and width are part of adjustment scheme. Therefore, it would have been obvious to have used a an equalizer and pulse compensating scheme in the system of Imaino as taught by Kirino because one would be motivated to detect tilt

angle more accurately and distortion of the waveform of reading signal can be removed in a high density recording environment [col. 13, lines 50-64].

14. As to claim 30, Imaino discloses:

according to the predetermined scheme, said recording compensator adjusts a power level required for recording the recording pulse with respect to the detected defocus [col. 10, lines 16-26 and col. 13, line 47 to col. 14, line 16].

NOTE: layer change also causes focus error signal FES and laser power gets adjusted accordingly to compensate for focus.

15. As to claim 31, Imaino discloses:

according to the predetermined scheme, said recording compensator adjusts a power and a time required [when power is adjusted, time inherently gets adjusted because time adjustment changes the power] for recording the recording pulse with respect to the detected tilt [col. 10, lines 16-26 and col. 13, line 47 to col. 14, line 16].

NOTE: layer change also causes focus error signal FES and laser power gets adjusted accordingly to compensate for focus

16. As to claim 32, Kirino discloses:

said recording compensator adjusts a write power with respect to the detected defocus, and generates the recording pulse earlier to compensate for an amount of shift with respect to the detected tilt, and adjusts a power and/or a time of the shifted recording pulse to compensate the length and the width of the recording mark [col. 13 lines 39-64 and col. 19, lines 13-47].

17. As to claim 33, Kirino discloses:

said recording compensator adjusts the power required for recording to compensate the length of the recording mark, and adjusts the time required for

recording in order to compensate the width of the recording mark [col. 13 lines 39-64 and col. 19, lines 13-47].

18. As to claim 34, Kirino discloses:

said recording compensator adjusts the power by adjusting a write power to compensate the length of the recording mark, and adjusts the time by adjusting an ending time of a first pulse and/or a starting time of a last pulse to compensate the width of the recording mark [col. 13 lines 39-64 and col. 19, lines 13-47].

19. As to claim 35, Kirino discloses:

said recording compensator both adjusts the power by adjusting a write power to compensate the length of the recording mark, and adjusts a power of a multi-pulse chain of recording pattern to compensate the width of the recording mark [col. 13 lines 39-64 and col. 19, lines 13-47].

20. As to claim 36, Imaino discloses:

a luminance source [fig. 7, unit 200] which provides the recording, wherein a wavelength of the luminance source is equal to or less than approximately 430 nm [col. 13, lines 9-27 and col. 10, lines 16-26].

NOTE: Blue laser inherently has wavelength of approximately 430 nm or less.

21. As to claims 37-38:

Regarding claims 37-38, combination of Imaino and Kirino does not specifically disclose that the numerical aperture is greater than or equal to 0.6 when substrate thickness is 0.3 mm or higher and numerical aperture is greater than or equal to 0.7 when substrate thickness is .3 mm or lower. Combination of Imaino and Kirino teaches that different wavelength would require different aperture of the lens and hence substrate thickness would also vary accordingly. The limitations in claims 37-38 do not define a patentable distinct invention over that in combination of Imaino and Kirino

since both the invention as a whole and combination of Imaino and Kirino are directed to processing the defocus and tilt and adjusting the power accordingly. The degree in which the aperture is adjusted or substrate thickness is selected presents no new or unexpected results, so long as the compensation of the defocus and tilt in a successful way. Therefore, to have different thickness of the substrate which corresponds to different numerical aperture would have been routine experimentation and optimization in the absence of criticality.

22. As to claim 39, it is rejected for the same reasons set forth in the rejection of claim 17, supra.
23. As to claim 40, Kirino discloses:
a power and/or time and an amount of shift required for recording to compensate when defocus and tilt occur together; and
power and/or time and an amount of shift required for recording to compensate when defocus or tilt occurs [col. 13 lines 39-64 and col. 19, lines 13-47].
24. As to claim 49, it is rejected for the same reasons set forth in the rejection of claim 29, supra.
25. As to claim 50, Imaino discloses:
the predetermined scheme comprises adjusting a power level required for recording the recording signal [col. 10, lines 16-26].
26. As to claims 51-53 they are claims corresponding to claims 11-13 respectively and they are therefore rejected for the same reasons set forth in the rejection of claims 11-13 respectively, supra.

27. As to claims 54-56 they are claims corresponding to claims 14-16 respectively and they are therefore rejected for the same reasons set forth in the rejection of claims 14-16 respectively, supra.
28. As to claim 57, it is rejected for the same reasons set forth in the rejection of claim 29, supra.
29. As to claim 58, Imaino discloses:
the detected defocus and detected tilt are detected using a light beam [fig. 7, unit 200] having a wavelength of roughly 430 nm or less [col. 13, lines 9-27 and col. 10, lines 16-26].
NOTE: Blue laser inherently has wavelength of approximately 430 nm or less.
30. As to claim 59, it is rejected for the same reasons set forth in the rejection of claim 58, supra.
31. As to claim 60, Kirino discloses:
predetermined scheme comprises adjusting a write time required for recording the recording signal [col. 13 lines 39-64 and col. 19, lines 13-47].
32. As to claim 61, it is rejected for the same reasons set forth in the rejection of claim 36, supra.
33. As to claim 62, Kirino discloses:
the compensating the write pulse with respect to detected tilt comprises adjusting a power and/or a write time required for recording the write pulse col. 13 lines 39-64 and col. 19, lines 13-47].

34. As to claim 63, it is rejected for the same reasons set forth in the rejection of claim 58, supra.

Other prior art cited

35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
- a. Bischel et al. (US. patent 5,544,268) "Display panel with ...".
 - b. Scalora et al. (US. patent 6,304,366) "photonic signal frequency ...".
 - c. Murakami et al. (US. patent 5,452,272) "Magneto-optical recording ...".
 - d. Ikeda et al. (US. patent 6,067,284) "**Recording power adjustment for optical storage apparatus**".
 - e. Kim (US. patent 6,345,034) "Recording medium having ...".
 - f. Yagi et al. (US. patent 5,699,342) "Method of and device for recording and playing ...".
 - g. Toda et al. (US. patent 6,272,100) "Information recording/reproducing apparatus and method ...".

Contact information

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gautam R. Patel whose telephone number is (703) 308-7940. The examiner can normally be reached on Monday through Thursday from 7:30 to 6.

The appropriate fax number for the organization (Group 2650) where this application or proceeding is assigned is (703) 872-9314.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Doris To can be reached on (703) 305-4827.

Application/Control Number: 09/603,204:
Art Unit: 2655

Page 13
Paper Number: 20

Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist whose telephone number is (703) 305-4700 or the group Customer Service section whose telephone number is (703) 306-0377.

Gautam R. Patel
Patent Examiner
Group Art Unit 2655

A handwritten signature in black ink, appearing to read "Gautam R. Patel", with a horizontal line drawn underneath the name.

July 9, 2003